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Congenital Vertebral Anomaly

Issue Description

Congenital vertebral anomalies are a collection of malformations of the spine in animals. Most are not clinically significant, but they can cause compression of the spinal cord by deforming the vertebral canal or causing instability. This condition occurs in the womb. Congenital vertebral anomalies include alterations of the shape and number of vertebrae.

Hemivertebrae

Among the congenital vertebral anomalies, hemivertebrae are the most likely to cause neurologic problems. They are wedge shaped vertebrae, and therefore can cause an angle in the spine (such as kyphosis, scoliosis, and lordosis). The most common location is the midthoracic vertebrae, especially the eighth (T8). Neurologic signs result from severe angulation of the spine, narrowing of the spinal canal, instability of the spine, and luxation or fracture of the vertebrae. Signs include rear limb weakness or paralysis, urine or fecal incontinence, and spinal pain. Most cases of hemivertebrae have no or mild symptoms, so treatment is usually conservative. Severe cases may respond to surgical spinal cord decompression and vertebral stabilization.

The probable cause of hemivertebrae is a lack of blood supply causing part of the vertebrae to not form. Hemivertebrae in dogs are most common in the tail, resulting in a screw shape, but can also occur in the thoracic vertebrae. Affected dog breeds include Bulldogs and French Bulldogs, Pugs, and Boston Terriers. It is inherited in Yorkshire Terriers and German Shorthaired Pointers. The condition can cause death in very young Bulldog puppies.

Block Vertebrae

Block vertebrae occur when there is improper segmentation of the vertebrae, leading to parts of or the entire vertebrae being fused. It can lead to an angle in the spine, but there are usually no symptoms. The sacrum is a normal block vertebrae.

Butterfly Vertebrae

Butterfly vertebrae have a cleft through the body of the vertebrae and a funnel shape at the ends. This gives the appearance of a butterfly on an x-ray. It is caused by persistence of the notochord (which usually only remains as the center of the intervertebral disc) during vertebrae formation. There are usually no symptoms. Butterfly vertebrae occur most often in Bulldogs, Pugs, and Boston Terriers.

Transitional Vertebrae

Transitional vertebrae have the characteristics of two types of vertebrae. The condition usually involves the vertebral arch or transverse processes. It occurs at the cervicothoracic, thoracolumbar, or lumbosacral junction. For instance, the transverse process of the last cervical vertebrae may resemble a rib. A transitional vertebrae at the lumbosacral junction can cause arthritis, disk changes, or spinal cord compression. One study found that male German Shepherd Dogs with a lumbosacral transitional vertebra are at greater risk for cauda equina syndrome, which can cause rear limb weakness and incontinence.

Spina Bifida

Spina bifida is characterized by a midline cleft in the vertebral arch. It usually causes no symptoms in dogs. It is seen most commonly in Bulldogs and Manx cats. In Manx it accompanies a condition known as sacrocaudal dysgenesis that gives these cats their characteristic tailless or stumpy tail appearance. It is inherited in Manx as an autosomal dominant trait.

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